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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,621	02/27/2006	Stephane Demiguel	AVAN/000315US	7188

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PATTERSON & SHERIDAN, LLP  
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HOUSTON, TX 77056

EXAMINER
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ANDERSON, GUY G

ART UNIT	PAPER NUMBER
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2883

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/26/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/527,621	<b>Applicant(s)</b> DEMIGUEL ET AL.	
	<b>Examiner</b> Guy G. Anderson	<b>Art Unit</b> 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

- 1.1 Regarding the objection to the specification and to claim 2 relating to the use of the term “generators”, examiner withdraws these objections in light of applicant’s arguments and explanation as to the meaning of the term.
- 1.2 Applicant's arguments filed 2/28/2007 regarding the rejection of claims 1-6 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive.
- 1.3 Regarding the reference US-5513196 to Bischel, applicant argues that because Bischel discloses an AR coated input face on the convex lens structure in Fig. 9, the claim limitation of having a convex shaped input face is not taught. Examiner disagrees.  
  
AR coated structures or coatings are well known in the art of optical design, whether using traditional glass lenses or manufacturing a lens structure from semiconductor materials as in the current application. The fact that an AR coating is on a lens structure does not change the fact that the input facet or face of the lens structure is concave or convex or cylindrical or spherical or planar or whatever shape the optical designer has made the lens. The input facet of a lens is not changed by the fact that there is an AR coating in front of the lens itself. Additionally, a lens can be reversed very easily so that, in the example of a convex-planar assembly, the planer side of the lens can be both input and output, as can the convex side, depending upon how the particular design is to be used in an optical system. This reversibility would of course be obvious to one who is skilled in the art of optical design. Therefore, the rejections are maintained.
- 1.4 Regarding the rejection of Claim 5 under 35 U.S.C. 103(a), applicant argues that because it depends from claim 1, and that the combination of Takeuchi and Bischel is defective in teaching a convex input face, that claim 1 is allowable, therefore, claim 5 is allowable because the addition of the cited non patent literature by Choa does not correct the deficiency. Examiner disagrees.  
  
As noted above, examiner feels that the rejection of claim1 is not deficient. Therefore, the rejection of claim 5 is maintained.

**Response to Amendment**

**Claim Rejections - 35 USC § 103**

- 2.1 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 2.2 Claim 1, 11, 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

Regarding Claim 1, Takeuchi specifically discloses a high power photodiode comprising/wherein:

1a) a light-absorbing layer, a waveguide coupled evanescently with the said light-absorbing layer, such waveguide having one end coupled with an input face of the component to receive an input wave. [Abstract, Fig. 1-7, Col. 2, Lines 25-60.]

11a) a photodiode; and a waveguide coupled evanescently to the photodiode via a light-absorbing layer, the waveguide having one end coupled with an input face that is configured to receive an input wave. [Abstract, Fig. 1-7, Col. 2, Lines 25-60.]

16a) a photodiode; and a waveguide coupled to the photodiode via a light-absorbing layer, the waveguide having one end coupled with an input face that is configured to receive an input wave, wherein the input face is formed by utilizing a deposition of materials and a photosensitive resist such that the input face has a shape of a cylindrical diopter.

Takeuchi does not specifically disclose a structure wherein:

1b) the component being characterized in that the input face is convex.

11b) wherein the input face is convex.

16b) wherein the input face is formed by utilizing a deposition of materials and a photosensitive resist such that the input face has a shape of a cylindrical diopter.

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Bischel discloses an optical source with mode reshaping comprising a convex integrated lens structure as a means of focusing energy into a waveguide.

[Abstract, Fig. 9, Col. 20, lines 32-67.] Additionally, methods such as using photosensitive resists and deposition are inherent in the art of optical semiconductor manufacturing and would have been known to one of ordinary skill in the art at the time of invention.

Since Bischel and Takeuchi are from the same field of endeavor, the integrated lens of Bischel would have been recognized in the pertinent art of Takeuchi.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the integrated lens of Bischel with the evanescent coupling structure of Takeuchi in order to more effectively couple power into the waveguide.

- 2.3 Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 2 depends.

Regarding Claim 2, Takeuchi does not specifically disclose a structure wherein:

- 2) the input face has the shape of a cylindrical diopter with generators perpendicular to the plane of the light-absorbing layer.

Bischel specifically discloses a cylindrically shaped convex lens structure. [Fig. 9.]

Since Bischel and Takeuchi are from the same field of endeavor, the integrated lens of Bischel would have been recognized in the pertinent art of Takeuchi.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the integrated lens of Bischel with the evanescent coupling structure of Takeuchi in order to more effectively couple power into the waveguide.

- 2.4 Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 3 depends.

Regarding Claim 3, Takeuchi does not specifically disclose a structure wherein:

- 3) the radius of curvature of the cylindrical diopter is of the order of 20 microns.

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It has been held where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only a routine skill in the art. *In re Aller*, 105 USPQ 233.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to design a specific radius of curvature of the integrated convex lens, as this would control the focal length of the integrated lens.

- 2.5 Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 4 depends.

Regarding Claim 4, Takeuchi specifically discloses a high power photodiode comprising/wherein:

- 4) a photodiode incorporating the light-absorbing layer. [Abstract, Fig. 1-7, Col. 2, Lines 25-60.]

- 2.6 Claim 5, 15, 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel in further view of a Non-Patent Literature publication "Packaging Relaxed Semiconductor Lasers with Diluted Waveguide Structure" by Choa et al., published by IEEE in 1994.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 5, 15, 20 depends.

Regarding Claim 5, 15, 20, Takeuchi does not specifically disclose a structure wherein:

- 5, 15, 20) the waveguide is a diluted waveguide.

Choa discloses a diluted waveguide structure which simplifies laser-fiber coupling and which can be applied to polarization independent photonic devices.

Since Choa, Bischel and Takeuchi are from the same field of endeavor, diluted waveguide of Choa would have been recognized in the pertinent art of Takeuchi.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine the diluted waveguide structure of Choa with the evanescent coupling structure of Takeuchi in order to more effectively couple power into the waveguide.

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- 2.7 Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 4 depends.

Regarding Claim 6, Takeuchi specifically discloses a high power photodiode comprising/wherein:

6) the waveguide comprises at least: a first InP layer, an InGaAsP layer deposited on the first InP layer, and a second InP layer deposited on the InGaAsP layer. [Abstract, Fig. 1-7, Col. 3, Lines 20-67.]

- 2.8 Claim 7-8, 10, 12-14 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 7-8, 10 depends.

Regarding Claim 7-8, 10, Takeuchi does not specifically discloses a high power photodiode comprising/wherein:

7, 12) the shape of the input face is formed by an etching process.

8, 14) the cylindrical diopter shape of the input face is formed by utilizing a deposition of materials and a photosensitive resist.

10) the deposition of materials comprises a layer of silicon dioxide.

13) the input face has the shape of a cylindrical diopter.

However, Takeuchi discloses an etching process [Col. 3, lines 20-67] for the structure disclosed and Bischel discloses using materials such as Lithium Niobate. [Col. 10, lines 11-12.]

Bischel discloses an optical source with mode reshaping comprising a convex integrated lens structure as a means of focusing energy into a waveguide. A convex shape is equivalent to cylindrical diopter. [Abstract, Fig. 9, Col. 20, lines 32-67.]

Additionally, methods such as using photosensitive resists and deposition are inherent in the art of optical semiconductor manufacturing and would have been known to one of ordinary skill in the art at the time of invention.

Regarding the use of silicon dioxide, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Therefore, the limitations in claims 7-8, 10, 12-14 would have been obvious to one of ordinary skill at the time of the invention and a PHOSITA would have known to combine those limitations with Takeuchi and Bischel in order to provide a high power photodiode with integrated structure as in Takeuchi.

- 2.9 Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 9 depends.

Regarding Claim 9, Takeuchi specifically discloses a high power photodiode comprising/wherein:

9) the deposition of materials comprises a layer of silicon nitride. [Col. 3, lines 48-52.]

- 2.10 Claim 17-18 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 17-18 depends.

Regarding Claim 17-18, Takeuchi does not specifically disclose a high power photodiode comprising/wherein:

17) the waveguide comprises an InP layer and an InGaAsP layer.

18) the InGaAsP layer has a thickness of 0.16  $\mu\text{m}$ .

However, Takeuchi discloses a layers of InP and InAlGaAs of 0.5  $\mu\text{m}$  and 0.7 $\mu\text{m}$  respectively in thickness. [Col. 3, lines 20-55.]

Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Further still, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges only involves routine skill in the art. In re Aller, 105 USPQ 233.



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Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize various materials and thickness depending upon the design criteria of the particular optical device being manufactured.

- 2.11 Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over US-6646317 to Takeuchi in view of US-5513196 to Bischel.

The combination of Takeuchi and Bischel discloses all of the limitations of the base claim upon which Claim 19 depends.

Regarding Claim 19, Takeuchi does not specifically disclose a high power photodiode comprising/wherein:

19) the cylindrical diopter is a convex convergent cylindrical diopter.

Bischel discloses an optical source with mode reshaping comprising a convex integrated lens structure as a means of focusing energy into a waveguide.

[Abstract, Fig. 9, Col. 20, lines 32-67.]

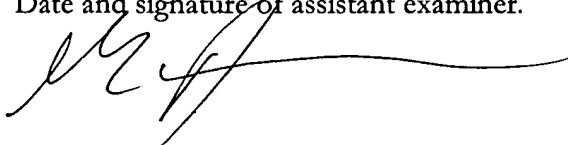
Cylindrical shapes can also be described as convex, so it would have been obvious to one of ordinary skill in the art at the time of invention to call the lens structure either convex or cylindrical.

### ***Conclusion***

- 3.1 **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
- 3.2 A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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- 3.2 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guy G. Anderson whose telephone number is 571.272.8045. The examiner can normally be reached on Tuesday-Saturday 0900-2200.
- 3.3 If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571.272.2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
- 3.4 Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.
- 3.5 Date and signature of assistant examiner.



March 15, 2007



Frank G. Font  
Supervisory Patent Examiner  
Technology Center 2800